

The Contact Theory

235

seems to admit the possibility of chemical attractions being able to produce electrical currents when they are not strong enough to overcome the force of cohesion, and so terminate in combination.¹ Schcenbein states that a current may be produced by a tendency to chemical action, *i.e.* that substances which have a tendency to unite chemically may produce a current, though that tendency is not followed up by the actual combination of the substances.² In these cases the assigned force becomes the same as the contact of Volta, inasmuch as the acting matters are not altered whilst producing the current. Davy's opinion was, that contact like that of Volta excited the current or was the cause of it, but that chemical changes supplied the current. For myself I am at present of the opinion which De la Rive holds, and do not think that, in the voltaic pile, mere contact does anything in the excitation of the current, except as it is preparatory to, and ends in, complete chemical action.

790. Thus the views of contact vary, and it may be said that they pass gradually from one to another, even to the extent of including chemical action: but the two extremes appear to me irreconcilable in principle under any shape; they areas follows.

- The contact theory assumes that when two different bodies being conductors of electricity are in contact, there is a force at the point of contact by which one of the bodies gives a part of its natural portion of electricity to the other body, which the latter takes in addition to its own natural portion; that, though the touching points have thus respectively given and taken electricity, they cannot retain the charge which their contact has caused, but discharge their electricities to the masses respectively behind them (1055): that the force which, at the point of contact, induces the particles to assume a new state, cannot enable them to keep that state (1057): that all this happens without any permanent alteration of the parts that are in contact, and has no reference to their chemical forces

(¹⁰⁵³; io57).

791. The chemical theory assumes that at the place of action

the particles which are in contact act
chemically upon each
other and are able, under the
circumstances, to throw more
or less of the acting force into a
dynamic form (682, 732);
that in the most favourable
circumstances, the whole is con-

¹ *Annales de Chimie*, 1835, ix. 171; and *Traits de
VElectricite*, i. pp. 253,
258.

² *Philosophical Magazine*, 1838, xii. 227, 311, 314;.
also *Bibliothèque
Universelle*, 1838, xiv. 155, 395.